

EVALUATING RIPARIAN MANAGEMENT ZONES
ON
STATE LANDS

Approved Interim Guidelines

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TABLE OF CONTENTS

I.	Preface	Page 3
II.	Values associated with RMZs	Page 3
	A. Water quality	Page 3
	B. Aquatic habitats	Page 3
	C. Aesthetics	Page 3
	D. Recreation	Page 4
	E. Forest products	Page 4
	F. Unique wildlife and habitats	Page 4
	G. Travel corridors	Page 4
	H. Threatened and endangered species	Page 4
	I. Unique ecological communities	Page 5
	J. Cultural resources	Page 5
III.	Review of management practices and other restrictions	Page 5
	A. Biodiversity conservation, stewardship and old growth	Page 5
	B. Beaver management policy	Page 5
	C. Sand dredging	Page 5
	D. Large woody debris	Page 6
	E. Best management practices	Page 6
	F. State natural river & federal wild & scenic river designations	Page 6
IV.	Evaluation Criteria	Page 7
	A. Aesthetics	Page 7
	B. Unique values	Page 7
	C. Spatial context	Page 8
	D. Trade-offs	Page 8
	E. Aspect/slope	Page 8
	F. Water body	Page 9
	G. Stream order	Page 9
V.	Techniques to manage RMZs	Page 9
	A. Buffer strips for water quality	Page 9
	B. Time-of-year	Page 9
	C. Wildlife habitat	Page 9
	D. Road design and lay-out	Page 9
	E. Water crossings	Page 10
	F. Water diversion techniques	Page 10
	G. Soils	Page 10
	H. Road closures	Page 10
	I. Cultural resources	Page 10
VI.	Other concerns	Page 10
	A. Wildfires	Page 11
	B. Prescribed burns	Page 11
	C. Noncommercial cutting	Page 11
	D. Reforestation	Page 11
	E. Pesticides/herbicides	Page 11
	F. Exotics	Page 11
VII.	Resources available	Page 11
	Summary of Natural River Vegetation Strip Requirements	Page 12

EVALUATING RIPARIAN MANAGEMENT ZONES (RMZs) ON STATE LANDS

I. Preface

The following guidelines were developed to enable resource managers to evaluate management options in riparian zones on State lands. Management of riparian zones has been the topic of discussion among resource professionals at many compartment reviews. Demands on our natural resources and knowledge of ecosystems and species have increased. We have come to better understand the unique values and concerns of riparian areas. Added to this is the ability to factor social and economic values into the management equation. This has all served to make management of riparian areas more complex and difficult.

Best Management Practices (BMPs) for water quality as outlined in the MDNR Best Management Practices Manual are designed specifically to maintain water quality. These RMZ guidelines are designed to help DNR field managers consider all the values associated with riparian areas and think through the options and ramifications of proposed management actions. These guidelines may also be useful to those considering management of RMZs on private lands. They are not designed to provide answers. Rather, they present a process and a list of considerations to enable managers to manage holistically and to defend or explain their decisions.

A riparian area is the area of transition between aquatic and terrestrial ecosystems in which the terrestrial ecosystem influences the aquatic and vice-versa. Because of the unique conditions adjacent to lakes, streams and open water wetlands, riparian areas harbor a high diversity of plants and wildlife. They are ecologically and socially significant in their effects on water quality, aesthetics, habitat, bank stability, timber production, and contribution to overall biodiversity.

A riparian management zone, or RMZ, is the defined area consciously managed to protect functions and values of riparian areas. It may be a subset of, may equal, or may extend beyond the riparian area. For example, the riparian area of a particular stream may extend, ecologically, to the top of an adjacent bluff 100 feet from the stream channel, but its riparian management zone may extend 250 feet from the channel to adequately address aesthetic concerns, water quality, etc.

II. Values Associated with RMZs.

➤ Water Quality.

Although all human activities in a watershed ultimately affect what happens in our lakes and streams, the adjacent riparian zones are most critical. These zones are the filters/sponges for our surface waters. They minimize the runoff of sediment, nutrients and contaminants into surface waters. Having adequate forest cover in riparian zones prevents thermal pollution (warming of surface waters by solar heating and runoff).

➤ Aquatic Habitats.

Overall, we have good water quality, but poor aquatic (streambed) habitat. Most of our river systems have an excessive sand bedload from past human activities, primarily 19th century logging, road/stream crossings and poor land use practices. Maintaining healthy riparian zones serves to stabilize stream banks and trap sediments from surface runoff.

➤ Aesthetics.

The definition of aesthetics centers on the sense of the beautiful. And we all have heard of the truism that “beauty is in the eye of the beholder.” Riparian areas, as a general category, probably are second only to roadsides as the most viewed forest areas. Unlike forested “roadsides”, riparian views are viewed when people are recreating and moving at a much slower pace. Hence, they are more critical from an aesthetic point of view.

➤ Recreation.

Riparian areas are utilized for a wide variety of recreation - fishing, canoeing, camping, picnicking, hunting, trapping, cross-country skiing, hiking, horseback riding, bird watching, mushroom picking, and mountain biking. Our rivers and riparian zones influence the way people spend their time. A large portion of local people's time is spent either enjoying the river's recreational opportunities or working to enable others to benefit from the river. Their thoughts and activities are determined by the river's character. Daily conversations center on how the existing river mood will affect personal pursuits or visitors, which in turn affects the area's economy and lifestyle.

➤ Forest Products.

The procurement of forest products is a legitimate use of state forest lands. It serves several purposes:

- Meets human needs in terms of wood and paper products.
- Supports economic needs in terms of jobs and business sustainability.
- Serves to maintain or develop a diversity of vegetative age classes, types, and habitats.
- Enhances recreational hunting via improved game habitat.
- Increases the value and quality of timber resources.
- Improvement of forest health.
- Reduction in fire danger.

However, since RMZs are areas of extra caution and heightened aesthetic significance, procurement of timber resources should be secondary in importance. Where BMPs will protect the RMZ, aesthetic integrity is maintained, and other values that may be of greater value are protected, procurement of timber products may proceed.

➤ Unique Wildlife and Habitats.

Several wild animal species are adapted to or take advantage of the unique conditions found in riparian areas. Michigan vertebrates include 72 bird species, 16 mammals, and 14 reptiles and amphibians associated with riparian habitats.

Riparian obligate species are those which *require* riparian habitats for all or part of their livelihood. Examples include wood ducks and river otters. Numerous amphibians and reptiles, such as tree frogs, wood turtles, and salamanders, spend much of their life in terrestrial habitat. But they need adjacent aquatic cover for breeding and egg laying in spring. Notable among birds are eagles, ospreys, and great blue herons, which use aquatic habitats for feeding but nest in large trees near rivers and lakes.

While many riparian-associated species are adapted to mature forest conditions, others are adapted to shrub habitats or young, early successional forests. Examples of the latter include yellow warblers and golden-winged warblers, and woodcock.

➤ Travel Corridors.

Because of their linear nature, stream and river valleys, and to some extent lakeshores, afford natural connectivity among habitats within and across landscapes. On a large scale, a major river or Great Lakes shoreline may be one component of a continental migratory path for songbirds, raptors, or waterfowl. On a local scale, a lowland hardwood forest along a stream bottom may provide a desirable travel corridor for bears moving from one part of their home range to another.

Although animals can and do use such travel corridors among local habitats, it is debatable how crucial they are to the survival of any particular species or individual animals. Some species are quite able to travel across an area regardless of intervening conditions; others are incapable of crossing inhospitable areas to get from one suitable habitat to another.

➤ Threatened and Endangered (T&E) Species.

As a rule, the greater the moisture availability, the greater the diversity and abundance of life. The protection or maintenance of ecological functions within a RMZ or any riparian area can play a key

role in the maintenance of threatened and endangered species and their habitat niches. Generally, the occurrence of T & E species is highest in riparian areas. Hence, great care and caution should be taken when implementing management activities within a RMZ or any riparian area where T & E species are likely to occur. Increasingly, biologists are recommending that forestry activities be modified where populations of T & E species (eg. red-shouldered hawk) occur in riparian areas.

➤ Unique Ecological Communities.

As with T & E species, unique ecological communities are often found near water and forests. Indeed, locating a unique ecological community within a RMZ often correlates with habitat for a variety of T & E species. Activities should be oriented to maintaining these communities. Usually, this involves eliminating or minimizing forest harvesting activity in and adjacent to these communities and attempting to control the influence of deer browsing within these communities as well. On state forest lands, examples include all cover types containing significant portions of hemlock or yellow birch, alvar glades and grasslands, or cedar on thin soils overlying bedrock.

➤ Cultural Resources.

Throughout the history of humankind, the presence of water and human activity has been inextricably linked. Indeed, most aboriginal settlements in Michigan occurred near or adjacent to water. Hence, the likelihood of finding sites of archeological and cultural significance within RMZ's is high compared to upland areas away from water.

III. Review of Management Practices and Other Restrictions.

➤ Biodiversity Conservation, Stewardship and Old Growth

The MDNR is currently in the process of developing a statewide plan for designating specific areas where biodiversity conservation (of which managing for old growth conditions will be a subset) will be a primary management priority. Any management activities undertaken within these areas will be compatible with (that is maintain or enhance) the biological conservation goals and objectives identified. Since many of these proposed areas are within or adjacent to riparian areas, the RMZ guidelines and their underlying intent will generally take precedence over any other considerations.

➤ Beaver Management Policy.

This policy was adopted by the MDNR in 2001. This policy is based on two principles. First, is that beaver/trout and the habitats they live in are managed for human needs and wants. Second, is to provide for the less common natural resource, while still providing opportunities for the more common to exist. High beaver populations can cause a variety of problems to society. These include, but are not limited to, a number of negative impacts to trout habitat, loss of trees, damage by flooding to roads, railroads, private property and buildings. Beaver are an integral part of many forest ecosystems. And they do play an integral part in maintaining and creating valuable temporary aquatic/wetland habitat for a variety of species. But their numbers can reach a point where they significantly change the functions of riparian ecosystems. Beaver populations should be maintained at a sustainable level without endangering or threatening other unique natural ecosystems.

It is recognized that beaver populations can be dynamic and that trapping regulations may need to be altered in response to changes in beaver populations and public desires. In an effort to recognize this balance, protect designated trout streams, and manage beaver as a valuable furbearer; a departmental beaver management policy was developed.

➤ Sand Dredging.

The water quality and fish habitat of Michigan's streams has been and is being degraded due to excessive sand bedload within the stream channel. Sources of sand include streambank erosion, road crossings, and recreational access points within watersheds. Historic land uses (19th century logging), subsequent home and road development, and present-day recreational use have all contributed to the resource degradation problems.

Natural, undisturbed stream channels hold many times greater trout biomass than altered channels. Fisheries Division research showed that excessive sand bedload had major effects on invertebrate populations and trout biomass, and removal of the sediment allowed recovery of these aquatic populations.

Currently, Fisheries Division maintains over two hundred sediment basins (sand traps) statewide, with no current plans to expand the program. The Michigan Council of Trout Unlimited, in partnership with the Michigan Oil and Gas Association, has developed a hydraulic suction dredge that can be used to remove excessive sediment from trout streams. Fisheries Division has agreed to a pilot project, where six sediment basins (three new and three existing) be emptied or constructed using the dredge. We will evaluate the dredge's economic viability, the effectiveness and utility of the dredge, and the dredge's environmental impacts, both aquatic and terrestrial.

➤ Large Woody Debris.

Many of our streams lack adequate woody instream cover, most of which was removed during 19th century logging to facilitate floating logs to market. This "large woody debris" provides cover for salmonids, home for aquatic invertebrates, adds nutrients, traps smaller debris, provides feeding and loafing sites for a wide variety of wildlife, and has other beneficial effects. Fisheries Division has developed a draft policy on large woody debris, which includes managing riparian zones for old growth and physical addition of trees.

➤ Best Management Practices (BMPs)

Forestry BMPs are those practices (structural, vegetative or managerial) that are used to reduce the amount of nonpoint source (nps) pollutants entering nearby rivers, streams, lakes and open-water wetlands. Sediments, nutrients, chemicals, heat and debris are all considered nonpoint source pollutants. With forestry activities, the two critical pollutants are sediment and increased water temperature. Sediment is an obvious nps pollutant coming off of roads and skid trails. Heat can also be a problem where forest cover adjacent to a stream is removed and stream temperatures rise.

All appropriate forestry BMPs are described in the MDNR manual "Water Quality Management Practices on Forest Land", typically referred to as "the forestry BMP manual." With respect to RMZ's, readers should make special effort to be familiar with section D in Chapter 1 of the manual. This section describes the concepts and specifications related to the use and application of buffer strips (see pp 4-6 in BMP manual).

➤ State Natural River and Federal Wild and Scenic River Designations.

There are currently 16 designated Natural River systems in Michigan. The majority of those systems are in northern Lower Michigan or the Upper Peninsula and most of those systems have a considerable amount of riparian State lands. A Natural River management plan has been developed for each designated river. Each plan includes use and development standards for private and public lands. The State is required to manage its lands and programs in accordance with the adopted Natural River plan.

In addition, all public agencies must comply with the Rules for Utilities and Publicly Provided Facilities adopted as mandated by Natural Rivers Part 305 of 1994 PA 451. These rules include standards related to road/stream crossings, erosion control, management of vegetation in utility corridors and others.

Natural River plans typically include standards related to public access site development, campgrounds, land and stream alteration, motorized vehicle use and vegetative buffer requirements. Thirteen of the 16 rivers also have State zoning rules based on the plans that contain private land development standards for residential development and limited commercial activity such as campgrounds, canoe liveries and rental cabins. Most rivers also have local zoning ordinances in effect based on Natural River plans.

Riparian vegetative buffers are maintained to provide fisheries and wildlife habitat, filter runoff, provide shade to cool water temperatures, prevent streambank erosion and sedimentation of the stream, screen new developments and maintain the aesthetic qualities of the stream. Buffers on public lands

along designated rivers range from 50 feet to 200 feet wide on each side of the river or tributary. Private land buffers also vary, but are statutorily limited to a width of no more than 100 feet on each side of the river. Dead, diseased, unsafe and fallen trees, as well as noxious plants, can be removed within the buffer. Typically, trees and shrubs may be selectively pruned or thinned for timber harvest, habitat improvement or to maintain public utility facilities. Clearcutting is not usually permitted within the buffer.

Other development standards for public land are designed to maintain the natural character of the river corridor, limit the impacts of recreational use and help prevent resource damage. New campgrounds have development standards such as setbacks for campsites and associated structures. New access site standards may restrict sites to “walk-in” only and include setbacks for parking areas. Within 400 feet of the river, motorized vehicle use is usually restricted to designated public roads and access roads to permitted areas. Land alteration is prohibited in areas of high groundwater.

Portions of sixteen rivers are currently designated as Federal Wild and Scenic rivers and eleven other river segments have been identified for further study under the Federal program. Most Federally designated rivers are not bordered by State land. However, the entire Pere Marquette River mainstream is federally designated and includes a significant amount of riparian State land. Many of the “study rivers” also includes riparian State lands. Contact appropriate US Forest Service Ranger District or DNR staff to determine if activities in the RMZ will affect State or Federal designated or “study “ rivers.

IV. Evaluation Criteria.

➤ Aesthetics

The depth (setback) of a riparian viewscape can never be standardized. Topography is the main determinant. Some riparian viewsapes may be only fifty feet, while others may be ¼ mile. However, that portion of a viewscape closest to the water is the more critical. In other words, what you do ¼ mile away within the riparian viewscape may be unacceptable 200 feet from the water’s edge.

Bear in mind that the riparian viewscape may be much deeper than a RMZ. A viewscape is a function or element of a RMZ.

The best approach to evaluating a proposed management action with a RMZ is to envision it from the water looking in to the riparian viewscape. How much human activity will the proposed action reveal? If you have the GIS capability, view the proposed action on your computer.

As will be discussed later, consider trade-offs. There may be a compelling reason not to give aesthetics the highest consideration in some cases.

➤ Unique Values.

Unique values are those values that are uncommon and have a positive significance in a social, biological, or ecological context. The feature may be unique from a regional, state, or worldwide standpoint. For example, a feature may be common in southern Lower Michigan, but rare in the Upper Peninsula, and therefore unique.

When thinking of unique values, ask questions like:

- Are T & E species present?
- Are there cultural sites present? If so, what are they and how rare or unique are they?
- Is the RMZ associated with a designated State Natural or federal Wild and Scenic river?
- Are rare plant communities present?
- Is a Blue Ribbon Trout stream involved?
- Are the common features present unique in a larger or smaller context?
- Is a unique value that is present desirable on that site?

➤ Spatial Context.

It is important to consider how a riparian area and its associated water body are situated in a landscape. For example:

- The “footprints” of natural processes such as fire and windthrow are often affected by the orientation of rivers or lakeshores. Thus, timber sale reserve patches laid out on the downwind side (based on summer prevailing winds) of water bodies might mimic areas that would have been protected from wildfires or naturally more windfirm due to wind exposure during stand establishment and growth.
- Different landscapes produce different patterns of water bodies. Management approaches may be altogether different for kettle lakes and ponds in moraines versus meandering rivers and oxbows in glacial lake plains. Such landscape characteristics also affect whether the riparian area will be relatively flat with a gradual transition from water to upland, or steep-banked with a rapid transition.
- The linear nature of streams and rivers may provide natural connectivity among/between different habitat elements within and among landscapes. Establishment of travel corridors for wildlife within riparian areas should consider:
 - ✓ The overall array of habitat conditions suited to a landscape and the connectivity needed among those habitats.
 - ✓ The habitat needs of the species expected to use the corridor.
 - ✓ The contribution of each riparian area to the overall desired condition of the landscape.
 - ✓ The current and projected condition of the habitats being connected.
 - ✓ Whether water bodies being linked have similar flora and fauna or not.
- Management decisions may vary greatly depending on how accessible the riparian area is for recreation, timber harvest, or other forest uses. Consider the location of riparian areas in relation to access points, roads, or recreation facilities.
- There may be an important relationship among water bodies within a landscape that could be affected positively or negatively through management. Springs and seeps may feed tributary streams, which in turn flow into rivers. Protecting riparian values along the river while ignoring them around the tributaries may result in net loss of riparian resource value.
- The current cover type composition, age class distribution, and management history of a RMZ often dictate what can or can't be done in an area. One needs to evaluate how past practices correlate with or affect RMZ management. For example, previous removal of hemlock within and adjacent to a riparian area, and therefore lack of a seed source, would necessitate hand planting or seeding to restore the species.

➤ Trade-offs.

Many forest management activities present trade-offs, and riparian guidelines may also present trade-offs for consideration. One example is the density of residual trees (basal area) in even-aged management, i.e. the more basal area left for aspen, the poorer the regeneration. However, the maintenance of riparian functions, in some situations, may be enhanced by leaving more residual basal area than normal for shade intolerant species such as aspen. There are also trade-offs as one moves farther from the water's edge. In recognition of these and other trade-offs, management proposals should include alternatives to provide some flexibility for different objectives and site considerations.

➤ Aspect/Slope.

It is important to consider how slope/aspect affect management within RMZs, not only because of their influence on shading, but also because:

- Steepness affects erosion and viewscape.
- The combination of soil and aspect determine potential vegetation types.
- Slope/aspect will have an effect on recreational uses.

➤ Water Body.

Designated trout streams and trout lakes and designated state Natural Rivers or federal Wild and Scenic rivers require extra precaution compared to non-trout streams, non-trout lakes, and open water wetlands.

➤ Stream Order.

Stream order or stream width may allow flexibility with respect to the width of the RMZ. First order streams may require a RMZ to be only half as wide as a 3rd or 4th order stream. (First order streams are headwater streams. A 2nd order stream is created when 1st order streams converge. A 3rd order stream is created when 2nd order streams converge).

V. Techniques to manage RMZs.

➤ Buffer strips for water quality

Buffer strip guidelines are a key component of a RMZ strategy. As described in the MDNR BMP manual (pp 6-9), buffer strips are areas adjacent to perennial and intermittent streams and other open water bodies where **extra precaution** is used in harvesting timber or other forest management practices (i.e. prescribed burning, herbicide application). The key functions of a forested buffer strip are to filter out sediment, etc. and provide shade for small streams. Timber harvesting is allowed per BMP manual specifications and Natural River plan provisions.

The minimum buffer strip width is 100 feet from the bank of a water body. The width of the buffer strip increases as slope increases. Required buffer strips may be wider along designated natural rivers. Allowable management activities are often more restrictive. The MDNR BMP manual does not specify the amount of basal area/acre or the number of trees/acre to leave within the strip. Rather, manual specifications provide the land manager with a great deal of discretion as to what is the appropriate type of management within the strip. The key idea managers must remember is that “form follow function” with the function being that the adjacent water body is not degraded by forest management activities.

➤ Time of year.

Generally, many riparian areas are occupied by wet, saturated soils. The MDNR BMP manual specifies that “equipment (eg. skidders) should not be operated ... when soils are saturated.” However, to achieve certain management objectives, equipment use in wet riparian areas is sometimes necessary. Where this is the case, the best time of year to operate equipment within the RMZ is mid-winter when soils are typically frozen, especially in northern Michigan. Operating in other seasons will likely lead to rutting and potential degradation of habitat. In addition, rutting greater than 6 inches deep will result in decreased site productivity and decreased ability of the soils to absorb sheet flows during rain events. Contract specifications should include a specification regarding rutting as operating during the winter season may still result in a great deal of rutting and soil compaction if soils are not frozen.

➤ Wildlife Habitat

Active management within RMZs should attempt to mimic natural processes. Snags, downed woody debris, and other residuals are especially important to riparian wildlife and should be left as much as possible when conducting management within a RMZ. Michigan Natural Features Inventory (MNFI) ecologists are strongly recommending maintenance of a conifer component within RMZ's wherever possible. Management should usually be aimed at maintaining a longer-lived, uneven-aged, mixed species type, although early successional habitat is also appropriate in some situations.

➤ Road design and layout.

With respect to RMZ's, placement of new roads within RMZs should be avoided. Where roads are necessary, they should intersect the RMZ perpendicular to the direction of the RMZ and follow MDNR

BMP guidelines (Chapter 2). These roads should be temporary. They should also be closed and revegetated and restored to a natural condition upon completion of management objectives.

➤ Water Crossings (bridges, culverts, fords)

All new water crossings should be temporary. Installation of all new or rehabilitation of old water crossings requires a permit from the Land and Water Mgt. Division, MDEQ. In general, installation of bridges as opposed to culverts minimizes impacts to stream flow and fish habitat. For temporary stream crossings, the use of temporary bridges is the ideal choice. Use of fords should be avoided due to higher risks of stream impacts. Fording requires that stream bank and approaches be stabilized with 3-inch sized mine rock or its equivalent. MDEQ rarely approves permits for installation of permanent or temporary fords.

Water crossings should always be installed perpendicular to the stream. Installation should also minimize impacts on fish passage, sedimentation, streambed scouring, stream gradients, channel constriction, and the free flowing condition of the stream.

➤ Water diversion techniques.

It is imperative that adequate water diversion techniques be implemented before reaching the buffer strip. Diversion devices within the buffer strip should be used with caution. If improperly constructed, their use may increase the likelihood that diverted runoff will enter the stream.

➤ Soils.

All soils disturbed during management operations, especially highly erodible types, such as sand or sandy loams, should be stabilized within the RMZ, especially road sideslopes. Stabilizing roadside slopes requires disking and grading, along with applying a suitable seed mixture and applying weed-free mulch over the seed.

➤ Road Closures.

All newly created roads in the RMZ used for timber sales should be closed as soon as possible after the sale is completed. Water bars should be installed and road surfaces should be seeded and mulched if regeneration of vegetation on the road surface is not occurring.

➤ Cultural Resources.

During field work within the RMZ/riparian area, staff should be alert for anything of archeological or cultural value.

If you suspect the site has cultural significance, be sure to contact the State Historic Preservation Office (SHPO) and ask for a site review by one of their specialists. Forest management activity within the RMZ should be avoided until notification by the SHPO that no cultural or archeological resources are known to exist in that area or that the proposed treatment has no impact on the cultural resource.

VI. Other Concerns.

➤ Wildfires.

Where wildfires occur in a RMZ, bare soil nearest to open water should be seeded and mulched as soon as possible after the fire has been put out. Seeding, mulching and water bar installation should be done for fire lines within the RMZ, especially where the terrain is sloping and fire lines run perpendicular to the stream. Silt fence or other soil stabilization techniques may be required to keep soil from eroding into open water until grassy vegetation becomes established.

Where a stream must be crossed with equipment, equipment operators should try to cross in a place and manner where disturbance to stream banks and streambed is minimized. The MDNR is responsible for any and all damage done to streams during the process of controlling wildfires.

➤ Prescribed Burns.

Prescribed burning within a RMZ should be avoided. However, if prescribed burning is the only management tool available to achieve a specific management objective, use of foam retardant is the preferred method of containing a prescribed burn within the RMZ. Use of plow lines should be avoided because they expose soil and increase the risk of stream sedimentation. Water bars and/or diversion ditches should be used where slope is greater than 2% and or where runoff can flow into a stream or other water body.

➤ Noncommercial Cutting

Trees felled and left on the ground within a RMZ provide habitat and woody debris. Heavy equipment use should be avoided. Avoid felling trees into streams.

➤ Reforestation.

Ideally, all regeneration within the RMZ should be natural. Where planting or seeding is necessary, avoid operating heavy equipment on saturated soils. Managers should dispose of heavy slash and other residue on upland sites. All equipment should be operated along the contours of the site.

➤ Pesticides/Herbicides.

In general, all chemical applications should occur outside the RMZ. The key concepts related to pesticide/herbicide application within or adjacent to a RMZ are: 1) mobility of chemicals, 2) persistence, 3) the accuracy of chemical application and 4) orientation, slope and aspect of the site with respect to the RMZ and the water body. Pesticides/herbicides may be necessary to control very aggressive exotic species, but must be done with utmost care and with approval of the Regional Forest Health Specialist.

➤ Exotics.

In riparian areas, as in other natural environments, introduction of exotic species is a concern. Avoid use of exotic plant species in stabilizing or revegetating disturbed areas. Development of a Department policy on native species is pending.

VII. Resources Available.

- Department Beaver Management Policy.
- Fisheries Division Woody Debris Policy.
- State Natural River Plans.
- MDNR Best Management Practices Manual.
- Federal Wild and Scenic River Plans.
- Forest Management Division Policy Manual.
- Riparian Management Reference (draft) – National Forests in Minnesota.
- Riparian Management in Forests of the Continental Eastern United States by Elon S. Verry, James W. Hornbeck, and C. Andrew Dolloff. Lewis Publishers.

Summary of Natural River Vegetation Strip Requirements

Designated Natural Rivers – Public and Private Lands

River	Public Lands		Private Lands	
	Mainstream – Tributary		Mainstream – Tributary	
Upper Peninsula				
Fox	200	200	100	100
Two Hearted	100	100	100	100
Northern Lower Peninsula				
Au Sable	150	150	75	50
Betsie	100	100	50	50
Boardman	100	100	75/50	50
Jordan	100	100	100	75
Pere Marquette	150	150	75	50
Pigeon	200	150	100	75
Pine	175	*155	100	50
Rifle	150	100	75	50
Upper Manistee	175	*155	75	75
Southern Lower Peninsula				
Flat	50	50	25	25
Huron	100	100	50	50
Kalamazoo	150	150	50	50
Rogue	100	100	50	25
White	100	100	50	50

All distances are in feet measured from the ordinary high water mark on each side of the river.
For additional information contact:

Upper Peninsula	Dan Pearson.....989-732-3541 ext 5047
Northern Lower	Dan Pearson.....989-732-3541 ext 5047
Southern Lower	Mathew Fry.....517-373-6868

*Various tributaries may have different regulations regarding vegetation strip widths based on operational requirements/limitations and slope. Please contact the Natural Rivers Administrator, Dan Pearson, for more specific information for activities and management that is permitted for a given tributary within this Natural River system.